

SOLICITATION NUMBER 01-SP-30-0078

HEADGATE ROCK DAM

HYDROELECTRIC POWER PROJECT - ARIZONA - CALIFORNIA

HEADGATE ROCK DAM POWERPLANT

COATINGS

TECHNICAL PARAGRAPHS

**HYDROELECTRIC POWER PROJECT - ARIZONA - CALIFORNIA
HEADGATE ROCK DAM POWERPLANT
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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01110 - SUMMARY OF WORK

PART 1 GENERAL

1.01 LOCATION

- A. Work is located at Headgate Rock Dam, on the Colorado River, in Parker, Arizona in LaPaz County. Headgate Rock Dam is approximately one miles northeast from the intersection of Arizona State Highway 95 and California State Highway 62 in Parker, AZ.

1.02 CONTRACT SCHEDULE AND SCHEDULE OF OUTAGES

- A. The entire contract work is scheduled to be completed between October 15, 2001 and March 30, 2002.
- B. The hydroelectric powerplant is an operating component of the Dam. There is a specific time frame that the three turbine-generator units in the hydroelectric powerplant can be taken out of service. Only one turbine-generator unit can be taken out of service at any one time. The contractor will only be able to work on one unit at a time, and that work shall be completed and accepted during the scheduled outage for that unit as listed below.
1. The powerplant coating work must be completed between the time frame of November 1, 2001 and March 1, 2002. During this period only one unit will be taken out-of-service at a time.
 2. For the contractor to complete their work, the scheduled outages for each of the three turbine-generator units are as follows:
 - a. Unit 1 - (the river side or west side of the power plant) will be taken out of service from November 1, 2001 through December 7, 2001.
 - b. Unit 2 - (center unit of the power plant) will be taken out of service from December 11, 2001 through January 25, 2002 .
 - c. Unit 3 - (the east side of the power plant) will be taken out of service from January 29, 2002 through March 1, 2002.
 3. The green colored bulkhead gates with lifting frame are used for the unit outages, and will not be available until Unit 3 is placed back in service. The Government personnel will remove the bulkhead gates after Unit 3 is placed back in service, and move the gates to the Contractors use area for the contractor to perform the contractual requirements by approximately March 5, 2002.
- C. The Government requires three days to de-water a unit and one day to restore a unit into operating mode. Unit 1 will be de-watered by November 1, 2001; Unit 1 will be restored on December 8, 2001 and Unit 2 will be de-watered by December 11, 2001; Unit 2 will be restored on January 26, 2002 and Unit 3 will be de-watered by January 29, 2002.
1. To isolate a unit(s) will require the following work to be completed:

- a. Shut down a turbine-generator unit(s), by Government forces.
- b. Close the upstream radial gate(s), by Government forces.
- c. De-water the turbine unit, by Government forces.
- d. The Government forces will place a clearance on the turbine-generator unit and radial gate, before work can be performed on the unit(s). The Contractor shall work with the Governments On-site Authorized Clearance Representative, to ensure that the unit is de-energized and isolated, in accordance with the Bureau of Reclamations "Safety and Health Standards" - 1993 Edition.
 - 1) A clearance is a statement, with documentation, which is declaring that the equipment to be worked on has been de-energized and isolated from all hazardous sources of energy.
 - a) The clearance on the turbine-generator unit(s) is to ensure that the unit(s) cannot be started, while the clearance is in place.

1.03 PRINCIPAL COMPONENTS OF WORK

- A. Division 01 - General Requirements:
 - 1. Administrative requirements, procedural requirements, temporary facilities, and controls which apply to execution of work.
- B. Division 09 - Finishes:
 - 1. Cleaning and preparing surfaces of previously coated items and uncoated items.
 - 2. Furnishing, and applying coating to the surfaces that were cleaned and prepared.

PART 2 PRODUCTS - (Not Used)

PART 3 EXECUTION - (Not Used)

END OF SECTION

SECTION 01111 - DRAWINGS

PART 1 GENERAL

1.01 QUALITY ASSURANCE

- A. Inform the Contracting Officer of any discrepancies, errors, or omissions discovered on drawings in accordance with the clause at FAR 52.236-21 - Specifications and Drawings for Construction.

1.02 PROJECT CONDITIONS

- A. Where there are minor differences as determined by the Contracting Officer between details and dimensions shown on drawings and details and dimensions of existing features at jobsite, use details and dimensions of existing features at jobsite.

1.03 SPECIFICATIONS DRAWINGS

- A. The drawings in the specifications are some of the drawings that were used to construct Headgate Rock Dam Powerplant. The drawings are to show the general sizes, configuration, and locations of the equipment to be cleaned, and coated. These drawings are to provide information required for bidding.

1.04 INFORMATIONAL DRAWINGS

- A. Some drawings are marked "Informational Drawings" in the drawing list. These drawings were contractor furnished drawings supplied under the contract for furnishing and installing the turbine-generator units. These drawings are included to show some additional details and features that can provide additional knowledge for bidding.

1.05 COPIES OF DRAWINGS

- A. The Government will furnish additional copies of drawings for performing work. Full-size copies of drawings will be furnished for construction purposes upon request. Copies of drawings will be limited to 3 prints.

1.06 LIST OF DRAWINGS

- A. Drawings listed in Table 01111A - List of Drawings, are made a part of these specifications.

PART 2 PRODUCTS - (Not Used)

PART 3 EXECUTION - (Not Used)

Table 01111A - List of Drawings

Sheet No.	Drawing No.	Title
General:		HEADGATE ROCK DAM - BUREAU OF INDIAN AFFAIRS HYDROELECTRIC POWER PROJECT - ARIZONA - CALIFORNIA HEADGATE ROCK POWERPLANT
1	1117-D-2	General Map (Rev. 5/22/86)
2	1117-D-3	Location Map (Rev. 11/25/87)
3	1117-D-4	General Plan (Rev. 5/27/86)
4	1117-D-9	General Arrangement - Floors - EL. 327.50 and EL. 343.25
5	1117-D-11	General Arrangement - Transverse Section Centerline Unit 2
6	1117-D-47	Unit Bays 1 & 2- Outline - d-line to h-line - Floor Elevation 327.50
7	1117-D-48	Unit Bays 3 - Outline - d-line to h-line - Floor Elevation 327.50
8	1117-D-348	Miscellaneous Metalwork - Frames, Covers and Grating
9	1117-D-366	Draft Tube 32.47 ft. x 14.19 ft. - Bulkhead Gate - Top Unit
10	1117-D-367	Draft Tube 32.47 ft. x 14.19 ft. - Bulkhead Gate - Bottom Unit
11	1117-D-369	Draft Tube 32.47 ft. x 14.19 ft. - Bulkhead Gate - Lifting Frame
12	1117-D-1942	Watertight Doors - Install/Assembly & Connection Arm Assy.
Informational Drawings: (Contractor Furnished)		
13	6563-AX-1	Voith Hydro. Dwg. Rev. 7 - General Arrangement
14	5846-ASE-1	Voith Hydro. Dwg. Rev. 2 - Draft Tube Liner Elevation
15	5846-ASH-1	Voith Hydro. Dwg. Rev. 0 - Draft Tube Liner Plan
16	3222-PG-1	Voith Hydro. Dwg. Rev. 1 - Shaft Guard
17	5180-OH-1	Voith Hydro. Dwg. Rev. 0 - Servomotor Arrangement
18	4840-ACZ-1	Voith Hydro. Dwg. Rev. 1 - Piping Details
19	4298-X-1	Voith Hydro. Dwg. Rev. 0 - Servomotor Support Column & Assy.
20	4298-Y-2	Voith Hydro. Dwg. Rev. 1 - Servomotor Support Ladder
21	5845-BVJ-1	Voith Hydro. Dwg. Rev. 3 - 32-inch Diameter Turbine Shaft
22	4834-CEH-1	Voith Hydro. Dwg. Rev. 0 - Air Admission Piping
23	6565-AC-1	Allis-Chalmers Dwg. Rev 0 - outer Gate Barrel Fabrication
24	1310-ALA-1	Allis-Chalmers Dwg. Rev 0 - 30x30 Draft Tube Mandoor Assy.
25	5196-EU-2	Allis-Chalmers Dwg. Rev 2 - Slip Joint Assy.

Sheet No.	Drawing No.	Title
26	5196-EX-1	Allis-Chalmers Dwg. Rev 1 - Discharge Ring Fabrication
27	5128-JI-1	Allis-Chalmers Dwg. Rev 4 - Gate Mechanism Assy.
28	26E113062	Villares Dwg. Rev 4 - Generator Base
29	26E113089	Villares Dwg. Rev 4 - Generator Cover Assy.
30	26E113099	Villares Dwg. Rev 4 - Generator Bearing Cover
31	26E113105	Villares Dwg. Rev 3 - Generator Coupling Side Bearing Cover
32	26D113257	Sh 1 of 2 - Villares Dwg. Rev 0 - Generator Bearing Oil Piping

END OF SECTION

SECTION 01117 - CONTRACTOR USE OF PREMISES**PART 1 GENERAL****1.01 GOVERNMENT LAND**

- A. The Contractor will be permitted to use Government land, controlled by the Bureau of Indian Affairs, for field office, storage yard, and other construction facilities required for construction purposes.
- B. Such use shall not interfere with any part of the work under this contract, nor with the work of other contractors or the Government in the vicinity, nor with reservations made, or as may be made, by the Government for the use of such land.
- C. Areas of Government land available for use by the Contractor for construction purposes are shown on drawing 2 (1117-D-3).

1.02 PRIVATE LAND

- A. If private land is used for construction facilities or other construction purposes, the Contractor shall make all necessary arrangements and pay all rental and other costs associated therewith.

1.03 COSTS

- A. No charge will be made to the Contractor for the use of Government land for construction purposes and all work required by this section shall be at the expense of the Contractor.

PART 2 PRODUCTS - (Not Used)**PART 3 EXECUTION****3.01 CONSTRUCTION FACILITIES**

- A. Arrange and operate construction facilities in a manner to preserve and protect existing features, trees, and vegetation to the maximum practicable extent. The location, construction, operation, maintenance, and removal of construction facilities on Government land shall be subject to the approval of the Contracting Officer.

3.02 REMOVAL OF CONSTRUCTION FACILITIES

- A. Upon completion of the work, the Contractor shall remove construction facilities and perform required cleanups.

3.03 REGRADING

- A. After removal of construction facilities and required cleanup, the Contractor shall regrade the Government land used for construction purposes and not required for the completed installation.

END OF SECTION

SECTION 01118 - MEASUREMENT AND PAYMENT**PART 1 GENERAL****1.01 RELATED REQUIREMENTS**

- A. FAR 52.232-5 Payments Under Fixed-Price Construction Contracts
- B. WBR 1452.232-81 Mobilization and Preparatory Work

1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the various items of work listed in the bidding schedule will be made in accordance with the clause at FAR 52.232-5. "Payments Under Fixed-Price Construction Contracts," and the following:
 - 1. Payment for mobilization and preparatory work will be made at the lump sum price bid therefor in the schedule in accordance with the clause at WBR 1452.232-81, "Mobilization and Preparatory Work."
 - 2. Payment for the preparation and cleaning of surfaces to be coated; for furnishing and applying the coating to the required surfaces will be made at the lump-sum price bid therefor in the schedule, which lump sum price shall include the cost of providing all labor and materials and all other work and materials required to complete the coating requirements outlined by these specifications paragraphs.

PART 2 PRODUCTS - (Not Used)**PART 3 EXECUTION - (Not Used)****END OF SECTION**

SECTION 01120 - GOVERNMENT-OWNED CRANE**PART 1 GENERAL****1.01 SCHEDULING**

- A. The Government will make available the crane, crane operator, and rigger(s) under these specifications without charge, for the work under this contract which is located in the upper storage area at Headgate Rock Dam site. The work consists of cleaning, preparing, repairing, and applying coating to the bulkhead gates and lifting frames.
- B. The Government makes no other commitment to the availability of the crane, crane operator or rigger for other contract work. If additional time is required for the use of the crane, crane operator, and rigger for other contract work, coordination with the Government will be required.

1.02 COST

- A. There is no cost associated with the use of the Government crane for work associated with contract work on the bulkhead gates and lifting frame.

PART 2 PRODUCTS- (Not Used)**PART 3 EXECUTION****3.01 USE OF CRANE**

- A. The Government crane will only be operated by the Government's crane operator.
- B. The operation and maintenance of the Government-owned crane will be performed by the Government.
- C. Repair of the Government-owned crane will be performed by the Government.

END OF SECTION

SECTION 01300 - SUBMITTALS

PART 1 GENERAL

1.01 COST

- A. Include the cost in the lump sum bid price in the schedule for cleaning, preparing and applying coatings to the required surfaces.

1.02 DEFINITIONS

- A. Days - Calendar days.
- B. Required Submittal Number (RSN) - RSN identifies items to be submitted together as a complete submittal.

1.03 SUBMITTAL REQUIREMENTS

- A. In case of conflict between requirements of this section and requirements included elsewhere in these specifications, requirements included elsewhere take precedence.
- B. Professional Certifications
 - 1. Sign and seal submittals requiring certification by a registered professional, registered in the State where the work is to be performed.
- C. Data
 - 1. Data to be prepared and furnished in English.
 - 2. Label data with Bureau of Reclamation contract number and schedule item number(s).
 - 3. Mark items to be furnished on manufacturers' data for commercial products or equipment, such as catalog cut sheets. Identify manufacturers' name, type, model, size, and characteristics. Illustrate that product or equipment meets requirements of specifications.

1.04 SUBMITTAL PROCEDURES

- A. Submit only checked submittals. Submittals without evidence of Contractor's checking and approval will be returned for resubmission.
- B. Submit complete sets of required materials for each RSN as specified in "Submittals" column in table 01300A. A complete set includes all listed items for RSNs with multiple parts.
- C. Submit number of sets specified in "No. of sets to be sent to": column in table 01300A.
- D. Include the following information in transmittal letters:
 - 1. Bureau of Reclamation contract number and title.
 - 2. Responsible code.
 - 3. RSN for each attached submittal.
 - 4. Number of sets for each RSN.
 - 5. Identify submittal as initial or resubmittal.
- E. More than one RSN may be submitted under a transmittal letter, provided the responsible code is the same.

1.05 GOVERNMENT REVIEW OF SUBMITTALS

A. Time Required

1. The Government will require 14 days for review of each submittal or resubmittal, unless otherwise provided in these specifications.
2. Time required for Government review of each submittal or resubmittal begins when the Government receives complete sets of materials required for a particular RSN and extends through return mailing postmark date.

B. Time in Excess of Specified

1. The Contracting Officer may extend the contract completion date to allow additional time for completing work affected by excess review time. The time extension will be to the extent that excess review time caused delay to the contract completion date. The time will not exceed the time used in excess of the specified number of days for review of submittals or resubmittals.
2. Concurrent days of excess review time resulting from the Government's review of two or more separate submittals or resubmittals will be counted only once in extending the contract completion date.
3. No time extension will be allowed if the Contractor fails to make complete approval submittals in sequence and within time periods specified.
4. Adjustment for Government delay will be made only to the extent that:
 - a. Government approval was required under the contract, and
 - b. Requests for approval were properly and timely submitted and were approved.
 - c. Actual delay, projecting completion resulted from the approval delay.
5. Adjustment will be subject to terms of paragraphs (b) and (c) of the clause "Suspension of Work," however, no such delay shall be deemed to be a "suspension order" as the term is used in that clause.

C. Return of Submittals

1. One set of submittals required for approval will be returned. The submittal will either be approved, not approved, or conditionally approved.
2. Revise and resubmit for approval, submittals not approved. Show changes and revisions with revision date. Describe reasons for significant changes in transmittal letter.
3. Resubmit returned submittals within 14 days after receiving the Government's comments, unless otherwise specified. Requirements for initial submittals apply to resubmittals.
4. Do not change designs without approval of the Contracting Officer after approval documentation and technical data have been approved.

1.06 TRANSMITTAL

A. Send submittals required by table 01300A to following addresses:

1. **Contracting Officer, Bureau of Reclamation, Attn: LC-3110, PO Box 61470, Boulder City NV 89006-1470**
2. **Regional Engineer, Bureau of Reclamation, Attn: LC-6300, PO Box 61470, Boulder City NV 89006-1470**
3. **Manager Parker Dam, Bureau of Reclamation, P.O. Box 878, Parker AZ. 92267**

B. Send a copy of each transmittal letter to offices listed above which are not sent the submittal.

- C. Submit data required to be submitted for which a specific mailing address is not given in these specifications to Regional Engineer.
- D. Submit submittals which are not listed in table 01300A in accordance with this section.

Table 01300A - List of Submittals

* CO indicates Contracting Officer, RE indicates Resident Engineer, and MG indicates Manager Parker Dam

RSN	Item	Reference provision, clause, or section	Responsible code	Submittals required	No. of sets to be sent to: *			Due date or delivery time
					CO	RE	MG	
1-C		FAR 52.228-15	CO	Performance and payment bonds	1	0	0	Within 15 days of contract award.
2-C	Accident prevention	FAR 52.236-13	CO	Accident exposure data	1	0	0	Submitted and accepted before commencing onsite work.
3-C	Safety and Health	WBR 1452.223-81	RE	Safety program	1	2	1	Submitted and accepted before commencing onsite work.
4-C	Progress updating	Section H	CO	(1) Blackline prints (2) Reports (3) Data on floppy disk	1	1	1	(1,2,3) Monthly
5-C	Contractor's construction program personnel	Section H	CO	Written designation of an authorized representative	1	2	1	Within 7 calendar days after receipt of Notice of Award
6-C	Material safety data sheets for hazardous materials	01305 52.223-3	RE	(1) List of Hazardous Materials and Material safety data sheets: (2) Updates MSDS and LHM	1	1	1	(1) After award, prior to delivery of each hazardous material (2) Prior to delivery
7-C	First-aid	01529	CO	Plans for providing medical attention; including professional contacts	0	1	1	Submitted and approved prior to start of operations
8-C	Protecting Existing Installations	01595	RE	Approval Data: Enclosures	0	3	1	Prior to procurement or installation
9-C	Materials	01600	RE	(1) Requests for deviation (2) Requests for substitution (3) Copies of Purchase Orders	1	3	1	(1, 2) Prior to ordering materials (3) 10 days after purchase of material
COATINGS:								
1-R	Paint and coating materials'	09900	RE	Approval data (1) Certifications (2) Samples (3) Material substitution	0	3	1	(1, 2) 10 days after purchase (3) Prior to ordering

PART 2 PRODUCTS - (Not Used)

PART 3 EXECUTION - (Not Used)

END OF SECTION

SECTION 01305 - SUBMISSION OF MATERIAL SAFETY DATA SHEETS FOR HAZARDOUS MATERIALS

PART 1 GENERAL

1.01 REFERENCES

- A. FAR 52.223-3 Hazardous Materials Identification and Safety Data

1.02 SUBMITTALS

- A. Submit the following in accordance with section 01300, "Submittals":
1. Submit, after award of contract, updated List of Hazardous Materials (LHM) and Material Safety Data Sheets (MSDS) in accordance with the requirements of the paragraph (e) of the clause at FAR 52.223-3, "Hazardous Materials Identification and Safety Data."
 2. Submit the updated LHM and completed MSDS and identification and certification for each material in accordance with section 01300, "Submittals":

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver any hazardous material to the jobsite which was not included on the original LHM, and prior to Bureau of Reclamation's acceptance of the Contractor's MSDS, and provisions for amending LHM.

1.04 COST

- A. Include the cost in the lump sum bid price in the schedule for cleaning, preparing and applying coatings to the required surfaces

PART 2 PRODUCTS - (Not Used)

PART 3 EXECUTION - (Not Used)

END OF SECTION

SECTION 01512 - TEMPORARY ELECTRICITY

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

- A. Include the cost in the lump sum bid price in the schedule for cleaning, preparing and applying coatings to the required surfaces

PART 2 PRODUCTS

2.01 SOURCE

- A. Power is available at the site at no cost to the Contractor. The voltages range between 110 and 480 volts. The Contractor will be responsible for supplying the required conduits, conductors, connectors and other electrical equipment to route the power to the various work locations. The connection of the Contractor's temporary conductors at the site's power source will be done by the Operations and Maintenance Personnel on-site. The Contractor shall coordinate and supply the required connectors needed to complete the connection.
- B. Grounding of all equipment is required. Connecting the equipment grounds to the existing grounding system at the site is acceptable and preferred. The Contractor is responsible for all labor and materials required for grounding the equipment and connecting to the existing grounding system.

PART 3 EXECUTION

3.01 EQUIPMENT AND FACILITIES

- A. The Contractor shall supply the required transmission lines, distribution circuits, transformers, and other electrical equipment and facilities required for distributing temporary power to points of use.

3.02 REMOVAL

- A. The Contractor shall remove all temporary equipment and materials upon completion of work under this contract.

END OF SECTION

SECTION 01514 - TEMPORARY WATER**PART 1 GENERAL****1.01 RELATED REQUIREMENTS**

- A. Include the cost in the lump sum bid price in the schedule for cleaning, preparing and applying coatings to the required surfaces

PART 2 PRODUCTS**2.01 SOURCE**

- A. Water is available at the site at no cost to the Contractor. The Contractor will be responsible for supplying the required filters, hoses, valves, and fittings and any other materials required to route the water to the various work locations, and assure the water meets the quality needed. The Contractor shall coordinate with the Operations and Maintenance personnel for the source points available at the site.

PART 3 EXECUTION**3.01 TEMPORARY WATER**

- A. Provide temporary water for construction purposes.

3.02 EQUIPMENT AND FACILITIES

- A. Provide all the equipment and facilities required for obtaining water and conveying water to points of use.

3.03 REMOVAL

- A. Remove temporary equipment and facilities upon completion of work under this contract.

END OF SECTION

SECTION 01529 - FIRST AID**PART 1 GENERAL****1.01 COST**

- A. Include the cost in the lump sum bid price in the schedule for cleaning, preparing and applying coatings to the required surfaces

1.02 REFERENCE

- A. U.S. BUREAU OF RECLAMATION (USBR)
 - 1. USBR RSHS Reclamation Safety and Health Standards - 1993 Edition

1.03 CLASS OF SERVICES

- A. Class A - First-aid services in accordance with section 4 of USBR RSHS.

1.04 SUBMITTALS

- A. Submit the following in accordance with Section 01300 - Submittals.
- B. Plans:
 - 1. For providing medical attention for injured or disabled employees
 - 2. Include onsite emergency procedures and professional medical contacts.

1.05 QUALITY ASSURANCE

- A. Conform to most stringent requirement in cases of conflict between requirements of this section and requirements of USBR RSHS.
- B. Do not perform onsite work until first-aid plans have been submitted, approved by the Contracting Officer, and implemented onsite.

1.06 AVAILABILITY

- A. Make facilities and services available for providing emergency aid to employees, subcontractor employees, and Government employees.
- B. Provide first-aid services free of charge to Government employees injured on the job.

PART 2 PRODUCTS - (Not Used)**PART 3 EXECUTION - (Not Used)****END OF SECTION**

SECTION 01540 - SECURITY & IDENTIFICATION OF EMPLOYEES**PART 1 GENERAL****1.01 DEFINITIONS**

- A. Construction Work Area(s):
 - 1. Construction work area(s) means area(s) where work is required under this contract.
- B. Restricted Area(s):
 - 1. Restricted area(s) means an area where entry will not be allowed unless authorized by the Site Representative.
- C. Security Measures:
 - 1. Security measures means those measures established to provide continuous and effective security of restricted areas.

1.02 SECURITY

- A. Headgate Rock Dam is a secure area. The security is primarily by a series of fences and locked gates which help to provide controlled access to the site. The Dam and areas around the Dam are considered restricted areas and the Contractor shall be responsible for initiating necessary measures to ensure that the Contractor's employees comply with all established security rules and regulations including but not restricted to the following:
 - 1. Construction Work Areas:
 - a. The construction work areas and access ways to the construction work areas can be used by construction personnel. It shall be the Contractor's responsibility to ensure by appropriate and effective means that its personnel remain in these areas while on the jobsite.
 - 2. Restricted Areas:
 - a. Any area not designated as a Construction work area or construction access area will be considered a Restricted Area to the construction personnel. Access outside of the construction or construction access areas will not be permitted unless so authorized by the Site Representative. Such entry shall be in accordance with and subject to the security regulations established in the area. It shall be the Contractor's responsibility to ensure by appropriate and effective means that its personnel shall not enter these areas unless authorized as set fourth above.

1.03 COSTS

- A. Include the cost in the lump sum bid price in the schedule for cleaning, preparing and applying coatings to the required surfaces.

PART 2 PRODUCTS - (Not Used)**PART 3 EXECUTION - (Not Used)****END OF SECTION**

SECTION 01550 - ROADWAYS, AREAS, AND HAUL ROUTES

PART 1 GENERAL

1.01 DEFINITIONS

- A. Areas:
 - 1. Areas mean any parking or service areas existing or constructed for temporary or permanent use under the contract.
- B. Maintenance:
 - 1. Maintenance means any work required or necessary to keep roadways, areas, and haul routes in a sound condition free of excavated material, construction equipment, products, and mud.
- C. Repair:
 - 1. Repair means any work required or necessary to bring existing and permanently constructed roadways, areas, and haul routes to original or specified condition.

1.02 REGULATORY REQUIREMENTS

- A. Meet all conditions established for the use of existing roadways, areas, and haul routes by those having jurisdiction over there, including seasonal or other limitations or restrictions, the payment of excess size and weight fees, and the posting of bonds conditioned upon repair of damage caused by the Contractor.
- B. Comply with applicable local regulations for roadways, areas, and haul routes over public highways, roads, or bridges.

1.03 SITE CONDITIONS

- A. Rights-of-way access to the work site is from existing roads and operations and maintenance roads, only. Construction use areas are in established areas as shown on the drawings. The unavailability of transportation facilities or limitations thereon shall not become a basis for claims for damages or extension of time for completion of work.

1.04 COSTS

- A. The cost of complying with this section shall be at the Contractor's expense.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide materials to maintain and repair existing roadways, areas, and haul routes that comply with the requirements of the jurisdictional authority.
- B. Provide materials to construct, maintain, and repair temporary roadways, areas, and haul routes that are suitable for the service. Materials provided for the construction, maintenance, and repair of temporary roadways, areas, and haul routes shall be subject to the approval of the Contracting Officer.

- C. Provide materials to maintain roadways and areas constructed under this contract and used by the Contractor for construction work which meet the requirements specified in the contract for construction of the roadways and areas.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Investigate the condition of available public or private roads for clearances, restrictions, bridge-load limits, bond requirements, and other limitations that affect or may affect transportation to and from the jobsite.

3.02 ESTABLISHED ROADWAYS AND AREAS

- A. Established roadways and areas are available for the Contractor's use subject to existing restrictions.
- B. Only the designated areas for parking facilities may be used by construction personnel. Locate additional offsite parking when site space is not adequate.

3.03 HAUL ROUTES

- A. Use existing available public highways, roads, or bridges as haul routes subject to the applicable local regulations.
- B. Minimize interference with or congestion of local traffic.
- C. Provide barricades, flag-persons, and other necessary precautions for safety of the public as required for the performance of the contract work.

3.04 ROADWAYS AND HAUL ROUTES AT DAM

- A. No construction of temporary roads will be necessary or permitted.

3.05 MAINTENANCE

- A. Maintain roadways and use areas in a sound condition.

3.06 REPAIR

- A. Promptly repair any damage to the existing roads, which include breaks, potholes, low areas, standing water, and other deficiencies to maintain paving and drainage in original or specified condition.

END OF SECTION

SECTION 01562 - DUST CONTROL

PART 1 GENERAL

1.01 REFERENCE

- A. U.S. BUREAU OF RECLAMATION (USBR)
 - 1. USBR RSHS Reclamation Safety and Health Standards - 1993 Edition

1.02 REGULATORY REQUIREMENTS

- A. Comply with Federal, State, and local laws and regulations.
- B. Comply with USBR RSHS.
- C. Conform to most stringent requirement in cases of conflict between specifications, regulatory requirements, and USBR RSHS.
- D. Contractor shall be responsible for damages resulting from dust originating from Contractor operations.
- E. Government may stop any construction activity contributing to dust levels which are excessive or in violation of Federal, State, or local laws and additional expenses resulting from work stoppage will be responsibility of Contractor.

1.03 COST

- A. Except as specified above for damages and work stoppage, include the cost in the lump sum bid price in the schedule for cleaning, preparing and applying coatings to the required surfaces.

PART 2 PRODUCTS - (Not Used)

PART 3 EXECUTION

3.01 APPLICATION

- A. Provide dust control and abatement during the contract period.
- B. Prevent, control, and abate dust pollution on rights-of-way provided by Government or elsewhere during performance of work.
- C. Provide labor, equipment, and materials, and use efficient methods wherever and whenever required to prevent dust nuisance or damage to persons, property, or activities.

END OF SECTION

SECTION 01564 - NOISE CONTROL**PART 1 GENERAL****1.01 REFERENCE**

- A. U.S. BUREAU OF RECLAMATION (USBR)
 - 1. USBR RSHS Reclamation Safety and Health Standards - 1993 Edition

1.02 REGULATORY REQUIREMENTS

- A. Comply with Federal, State, and local laws and regulations.

1.03 PROJECT CONDITIONS

- A. Comply with USBR RSHS.
- B. Conform to most stringent requirement in cases of conflict between specifications, regulatory requirements, and USBR RSHS.
- C. It is anticipated that noise barriers and equipment mufflers will not be required.

1.04 COST

- A. Include the cost in the lump sum bid price in the schedule for cleaning, preparing and applying coatings to the required surfaces.

PART 2 PRODUCTS - (Not Used)**PART 3 EXECUTION - (Not Used)****END OF SECTION**

SECTION 01568 - LIGHT CONTROL

PART 1 GENERAL

1.01 COST

- A. Include the cost in the lump sum bid price in the schedule for cleaning, preparing and applying coatings to the required surfaces.

PART 2 PRODUCTS - (Not Used)

PART 3 EXECUTION

3.01 GENERAL

- A. Provide light control during construction.
- B. Direct stationary floodlights to shine downward at an angle less than horizontal.
- C. Shield floodlights so that floodlights will not be a nuisance to surrounding areas.
- D. Direct lighting so that traffic is not affected by direct beam of light.
- E. Correct lighting control problems when they occur.

END OF SECTION

SECTION 01595 - PROTECTING EXISTING INSTALLATIONS**PART 1 GENERAL****1.01 SUBMITTALS**

- A. Submit the following in accordance with the section 01300 "Submittals":
1. Contractors proposed enclosures, which shall include, design, equipment, material, and anchorage data.

1.02 CONTRACTOR'S RESPONSIBILITY

- A. The Contractor shall be responsible for and shall repair, at the Contractor's expense, any damage to existing installations due to the Contractor's operations or the Contractor's failure to provide proper protection; or at the option of the Contracting Officer, any such damage may be repaired by the Government, and the Contractor will be backcharged for the cost thereof.

1.03 CONDITIONS

- A. Drawings included in these specifications show the general items of existing materials and equipment but do not purport to show all equipment and materials existing at the worksites.

1.04 COST

- A. Except as provided above, for the repair of installations damaged by the Contractor's operations, include the lump sum cost of all protection, including furnishing all necessary materials and construction and removing protective installations, in the lump sum bid price in the schedule for cleaning, preparing and applying coatings to the required surfaces

PART 2 PRODUCTS - (Not Used)**PART 3 EXECUTION****3.01 SITE OPERATIONS**

- A. The Powerplant is an operating component of the Dam, and portions will be in operation during the time of this contract. There are three turbine-generator units that this contract requires work to be performed on. Only one unit at a time will be taken out of service while the Contractor performs and completes the contract requirements for that unit. Therefore, the Contractor shall schedule with the Site Representative to ensure which unit will be taken out of service for the contractor to perform and complete the required contract work.

3.02 CONTRACTOR'S OPERATIONS

- A. In performing work in the vicinity of and in the existing powerplant, take all necessary precautions to safeguard existing installations.
- B. Furnish, install, and maintain adequate protection as needed to safeguard personnel and existing facilities from harm due to the Contractor's operations.
- C. Arrange all protective installations so as to permit operation of the existing equipment and facilities by the Government while work under these specifications is in progress.

- D. Do not discharge anything but clear water into the building drainage system.
- E. Do not permit dust to enter the ventilating systems.

3.03 ENCLOSURES

- A. If required to prevent dust, spalls, chips, grit, and other foreign material from endangering personnel and contaminating or damaging equipment during construction operations, the Contractor shall construct enclosures.
- B. Provide enclosures sufficient to confine the Contractor's operations to the immediate work area and to prevent contaminating and damaging the existing facilities.
- C. Enclosures shall be subject to approval of the Regional Engineer.

3.04 REMOVAL OF PROTECTIVE INSTALLATIONS

- A. Remove all protective installations provided by the Contractor after they have served their purpose. The materials furnished by the Contractor to provide protection shall remain the property of the Contractor and, after removal, shall be transported from the worksite.

END OF SECTION

SECTION 01600 - MATERIALS

PART 1 GENERAL

1.01 REFERENCES

- A. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
 - 1. ANSI B1.1-1989 Unified Inch Screw Threads (UN and UNR Thread Form)
 - 2. ANSI B1.20.1-1992 Pipe Threads, General Purpose (Inch)
- B. U. S. BUREAU OF RECLAMATION (USBR)
 - 1. USBR RSHS Reclamation Safety and Health Standards - 1993 Edition

1.02 DEFINITIONS

- A. Material
 - 1. "Material" and "materials" mean any equipment, machinery, product, component, or items required to be furnished and incorporated in the work by the Contractor.
- B. Established Manufacturer
 - 1. The words "Manufacturer," "Established Manufacturer," "Regular Manufacturer," "Manufacturer regularly engaged," or words of similar import where specified elsewhere in this section or these specifications mean a manufacturer as defined in 48 CFR 22.601 and 22.606 and qualified as a manufacturer under 41 CFR 50-206.51 or 50-206.52.

1.03 SUBMITTALS

- A. Submit the following in accordance with section 01300, "Submittals":
 - 1. Written requests to deviate from, or to use materials not covered by recognized specifications or standards. See article 2.01.
 - 2. Written requests to use substitute materials. See article 2.02.
 - 3. Copies of purchase orders. See article 2.04.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Transport and handle manufactured products in accordance with the manufacturer's instructions.
- B. Store and protect manufactured products in accordance with manufacturers' instructions and USBR RSHS. Obtain these instructions from the manufacturer before delivery of the materials to the jobsite. Maintain a copy of these instructions at the jobsite.
- C. Protect materials subject to adverse effects from moisture, sunlight, ultraviolet light, or weather during storage at the jobsite.
- D. Store curing compounds, sealants, adhesives, paints, coatings, sealers, joint compounds, grouts, and similar products at the temperature and environmental conditions recommended by the manufacturer.

1.05 MAINTENANCE

- A. Extra Materials

1. Furnish additional maintenance materials specified as "extra materials" in the specifications. Provide maintenance material identical to the installed material and provide from the same manufacturer's production lot as the installed material.
2. Package extra materials for storage and label with the complete product identification on the packaging.
3. Deliver extra materials to the Government at the jobsite and place in storage as directed by the Contracting Officer's representative.

1.06 COST

- A. Include the cost of furnishing, hauling, storing, handling, and installation in the lump-sum bid price in the schedule or cleaning, preparing, and applying coatings to the required surfaces.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide all materials required for completion of work.
- B. Provide type and quality described in these specifications. Make diligent effort to procure specified materials from any and all sources.
- C. Provide new materials of the most suitable grade for the purpose intended considering strength, ductility, durability, and best engineering practice in accordance with these specifications.
- D. Except as specified, conform to Federal specifications or standards, or, if there are no applicable Federal specifications or standards, conform to the specifications or standards of American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), American Society of Mechanical Engineers (ASME), Society of Automotive Engineers (SAE), Institute of Electrical and Electronic Engineers (IEEE), National Fire Protection Association (NFPA), or other nationally recognized standards organization.
- E. If the Contractor proposes to deviate from, or to use materials not covered by recognized specifications and standards, the Contractor shall submit, for approval, the justification for and exact nature of the deviation, and complete specifications for the materials proposed for use.

2.02 SUBSTITUTIONS

- A. If materials required by these specifications are unavailable, because of Government priorities or other causes, substitute materials may be used.
- B. Obtain written approval to use substitute materials from the Regional Engineer. State in the request for approval the amount of the adjustment, if any, to be made in favor of the Government.
- C. Regional Engineer's determination as to whether substitution will be permitted and as to what substitute materials may be used, shall be final and conclusive. If approved substitute materials are of less value to the Government or involve less cost to the Contractor than the specified material, a contract adjustment will be made in favor of the Government. Where the amount involved or the importance of substitution warrants, a deductive modification to the contract will be issued. No payments in excess of prices bid in the schedule will be made because of substitution of one material for another or because of use of one alternate material in place of another.

2.03 WORKMANSHIP

- A. Accurately manufacture and fabricate materials in accordance with best modern practice and requirements of these specifications, notwithstanding minor errors or omissions therein.

2.04 SOURCE QUALITY ASSURANCE

- A. Materials will be subject to inspection at any one or more of the following locations, as determined by the Contracting Officer:
1. At place of production or manufacture.
 2. At shipping point.
 3. At jobsite.
- B. To allow sufficient time to provide for inspection, the Contractor shall submit to the Regional Engineer, at the time of issuance, copies in triplicate of purchase orders, including drawings and other pertinent information, covering material on which inspection will be made as advised by the Regional Engineer, or shall submit other evidence in the event such purchase orders are issued verbally or by letter.
- C. Inspection of materials at any of the locations specified above or waiving of the inspection shall not be construed as being conclusive as to whether materials and equipment conform to contract requirements, nor shall the Contractor be relieved thereby of the responsibility for furnishing materials meeting the requirements of these specifications. Acceptance of materials will be made only at the jobsite.

PART 3 EXECUTION**3.01 FIELD QUALITY CONTROL**

- A. Final inspection and acceptance of materials will be made only at the jobsite after installation and testing.

END OF SECTION

DIVISION 9 COATINGS

SECTION 09900 - COATINGS

PART 1 PAINTING AND PROTECTIVE COATINGS

1.01 GENERAL

- A. The Contractor shall prepare, clean and apply protective coatings to the surfaces hereinafter specified. Coated surfaces shall be protected from abrasion or other damage at all times. Surfaces not to be painted shall be protected by appropriate means during cleaning and painting of adjacent surfaces. The principal features include:
1. Miscellaneous items: Unpainted: [Appendix Figures (7 through 21)]
 - a. Fixtures, stands and jigs
 2. Turbines: Three (3) units, including: [Appendix Figures (1,3, and 5)]
 - a. Turbine man doors
 - b. Draft tube
 - c. Generator-turbine shaft guard
 - d. Outer gate barrel
 - e. Slip joint
 - f. Discharge ring
 - g. Servomotors assembly, supports, etc.
 - h. Gate operating mechanisms
 - i. Air admission piping
 3. Generators: Three (3) units, including: [Appendix Figures (1 & 2)]
 - a. Bases
 - b. Air housing
 - c. Bearing housing (upstream and downstream)
 - d. Exciter and bus duct
 - e. Pipe, fittings and valves to generator
 4. Bulkhead gates with lifting frame (Green): [Appendix Figure (4)]
 5. Bulkhead gates (Black): [Appendix Figure (6)]
 6. Turbine-generator shafts (3 shafts): [Appendix Figures (1 & 5)]
 7. Watertight doors (3 doors)

1.02 COST

- A. Include cost of furnishing, preparing, and applying materials for cleaning, coating repair, or coating operations in the lump-sum price bid in the schedule, for cleaning, preparing, and applying coatings to the required surfaces. The cost shall include the cost for furnishing and

submitting manufacturer's instructions, purchase orders, certifications, MSDS sheets, and all the labor and materials required to complete the requirements of these specifications.

- B. The costs for delays from additional testing resulting from unnecessary small purchases, rejection of materials submitted or due to inadequate coverage are the responsibility of the Contractor.

1.03 REFERENCES

A. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

1. ASTM D 522-1993 Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings
2. ASTM D 870-1997 Standard Practice for Testing Water Resistance of Coatings Using Water Immersion
3. ASTM D 1141-1998 Standard Specification for Substitute Ocean Water
4. ASTM D 2244-1993 Standard Test Method for Calculation of Color Differences From Instrumentally Measured Color Coordinates
5. ASTM D 2794-1993 Standard Test Method for resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
6. ASTM D 3359-1997 Standard Test Methods for Measuring Adhesion by Tape Test
7. ASTM D 3363-2000 Standard Test Method for Film Hardness by Pencil Test
8. ASTM D 4060-1995 Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
9. ASTM D 4214-1997 Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
10. ASTM D 4285-1993 Standard Test Method for Indicating Oil and Moisture in Compressed Air
11. ASTM D 4541-1995 Standard Test Method for Pull-Off Strength of Coating Using Portable Adhesion Testers
12. ASTM D 4587-1991 Standard Practice for Conducting Tests on Paint and Related Coatings and Materials Using a Fluorescent UV-Condensation Light- and Water-Exposure Apparatus
13. ASTM D 5532-1994 Standard Test Method for Micaceous Iron Oxide Pigments (Paint)
14. ASTM G 8 - 1996 Standard Test Method for Cathodic Disbonding of Pipeline Coatings
15. ASTM G 42 - 1996 Standard Test Method for Cathodic Disbonding of Pipeline Coatings Subjected to Elevated Temperatures
16. ASTM G 53-1996 Standard Practice for Operating Light- and Water-Exposed Apparatus (Fluorescent UV-Condensation)
17. ASTM G 95 - 1998 Standard Test Method for Cathodic Disbonding of Pipeline Coatings (Attached Cell Method)

B. SOCIETY OF PROTECTIVE COATINGS (SSPC)/NACE INTERNATIONAL (NACE)

1. NACE RP0188-1999 Standard Recommended Practice - Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates
2. NACE RP0287-1995 Standard Recommended Practice, Field measurement of Surface Profile of Abrasive blast Cleaned Steel Surfaces Using a Replica Tape
3. SSPC-AB1-1991 Abrasive Specification No. 1 - Mineral and Slag Abrasives
4. SSPC-PA2-1996 Measurement of Dry Paint Thickness with Magnetic Gages

5. SSPC-SP1-1982 Surface Preparation Specification No. 1 - Solvent Cleaning
6. SSPC-SP3-1995 Surface Preparation Specification No. 3 - Power Tool Cleaning
7. SSPC-SP11-1995 Surface Preparation Specification No. 11 - Power Tool Cleaning to Bare Metal
8. SSPC-SP6/NACE 3-1994 Joint Surface Preparation Standard - SSPC-SP6/NACE No. 3 - Commercial Blast Cleaning
9. SSPC-SP7/NACE 4-1994 Joint Surface Preparation Standard - SSPC-SP7/NACE No. 4 - Brush-Off Blast Cleaning
10. SSPC-SP10/NACE 2-1994 Joint Surface Preparation Standard - SSPC-SP10/NACE No. 1 - Near-White Blast Cleaning
11. SSPC-VIS 1-1989 Visual Standard for Abrasive Blast Cleaned Steel (Standard Reference Photographs)
12. SSPC-VIS 3-1993 Visual Standard for Power- and Hand-Tool Cleaned Steel (Standard Reference Photographs)

C. **FEDERAL STANDARDS**

1. Federal Standard No. 595 B - 1989 Colors used in Government Procurement

1.04 SUBMITTALS

A. Submit in accordance with Section 01300 - Submittals.

B. Approval Data:

1. Submit following data for each coating material for approval:
 - a. Manufacturer's product data and application sheets.
 - b. Purchase orders. Include supplier's name, address, and phone number; purchase order number; purchase order date; manufacturer's brand name; batch number(s) for each material, except thinners; and quantities ordered for each material, except thinners.

C. Certifications:

1. Submit manufacturer's certification that each coating material meets specified requirements. Include following:
 - a. Manufacturer's name, address, and phone number
 - b. Batch number(s) for each material, except thinners.
 - c. Signature of manufacturer's technical representative and date of signature.
2. Submit manufacturer's certification that abrasive materials meet specified requirements.
3. Submit manufacturer's certification that micaceous iron oxide (MIO) pigmented materials meet specified requirements.

D. Approval Samples:

1. Submit samples of liquid and mastic materials, except thinners, from batch to be used for testing and approval:
 - a. Submit 1 quart sample of single component coating materials.
 - b. Submit 1 quart sample of each constituent of two-component coating materials.
2. Label each sample with following:
 - a. Contractor's name, address, and telephone number.
 - b. Date of transmittal.

- c. RSN number from List of Submittals in Section 01300 - Submittals.
 - d. Manufacturer's name, address and phone number.
 - e. Batch number.
- 3. Government may return remainder of submitted samples to Contractor after testing.
- E. Documentation: Submit written evidence of applicator qualifications.
- F. Submittals for "Or Equal" Substitution:
 - 1. For coating materials to be substituted for specified "brand name" material in Coating Categories below, submit following with specified approval data:
 - a. List of projects (not less than three) where material has been successfully used in applications similar to this project. Include project name and location; type of structure; owner's name, address, and telephone number; and application dates.
 - b. Manufacturer's certified test reports from testing of coating or coating system which demonstrate material meets or exceeds specified requirements for physical and performance characteristics.
 - c. Test panels and certified test reports from an independent laboratory.
- G. Include following information with each set of data, certification, or sample:
 - 1. Applicable tabulation number from Coating Tabulations below.
 - 2. Identification of item to be coated including sub-letter and sub-number from Coating Tabulations below.

1.05 QUALITY ASSURANCE

- A. Compliance Criteria for Coating Materials:
 - 1. Material is of same composition and formulation to meet physical and performance test results for one of following:
 - a. Submitted batch or previously tested batch materials complies with these specifications.
 - b. Submitted batch materials are unchanged from previously tested batch materials that complies with manufacturer's quality control (QC) and quality assurance (QA) programs.
 - c. Submitted batch materials complies with manufacturer's quality control (QC) and quality assurance (QA) programs as listed on product data and application sheets.

1.06 DELIVERY, STORAGE, HANDLING

- A. Deliver materials to jobsite in original unopened containers labeled with manufacturer's name, brand name, batch number, date of manufacture, and any special instructions. Damaged, leaking, or unlabeled containers will be rejected.
- B. Deliver materials in containers not larger than 5 gallons as packaged by manufacturer unless suitable equipment is provided at jobsite to handle and thoroughly mix materials in larger containers.
- C. Store materials in a well ventilated area.
- D. Do not expose to direct sunlight during storage.
- E. Comply with manufacturer's storage instructions.

- F. Do not use coating material which has exceeded manufacturer's specified storage stability period (shelf life).

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Comply with coating manufacturer's environmental restrictions. Comply with most restrictive requirements of coating manufacturer's restrictions and these specifications when coating manufacturer's restrictions conflict with these specifications.
- B. Do not apply coatings under following environmental conditions:
1. Substrate surface temperature less than 5 degrees Fahrenheit above dewpoint.
 2. Air and substrate surface temperature less than 50 degrees Fahrenheit.
 3. Humidity outside of manufacturer's recommended range.
- C. Do not apply coatings when environmental conditions are not expected to meet specified requirements for application during coating curing period.
- D. Maintain environmental conditions to meet specified requirements for application during coating application and curing. Provide heat and dehumidification required to maintain temperature and humidity conditions.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials required by these specifications and not listed in Coating Categories are subject to certification, sampling, and testing in accordance with this section.
- B. Provide compatible products of same manufacturer for coating system components.
- C. Abrasives:
1. Meet requirements of SSPC-AB 1, Type I or Type II, Class A.
 2. Do not exceed toxicity threshold limits for hazardous metals.
- D. Micaceous Iron Oxide (MIO):
1. ASTM D 5532, Type I, except as specified.
 2. Lamellar Content: 80 percent, minimum.
 3. Soluble Salt: 0.04 percent, maximum.
- E. Coatings:
1. Specified in Coating Categories below. Apply only one coating category per option in Coating Tabulations.
 2. Volatile Organic Compounds (VOC):
 - a. Do not to exceed maximum permitted by Federal, State, and local air pollution control regulations.
 - b. Do not exceed maximum content as supplied in container or by addition of thinner material.
 3. Factory color or tint. Do not color or tint at jobsite.
 4. Use thinners recommended by manufacturer for each coating material.

5. Use of accelerator products is not permitted unless approved by Contracting Officer's Representative.

2.02 EQUIPMENT

- A. Air Compressor and Spray Application Equipment:
 1. Provide adequately sized equipment in proper operating order.
 2. Equip with pressure gauges and pressure regulators.
 3. Equip with air supply lines free from oil and moisture. Keep lines free of oil and moisture during work.

PART 3 EXECUTION

3.01 PROTECTION OF ADJACENT SURFACES, EQUIPMENT AND NEWLY COATED SURFACES

- A. Protect items or surfaces not to be coated and adjacent to surfaces to be cleaned and coated from contamination and damage during cleaning and coating operations.
 1. Includes surfaces and equipment in physical contact with areas being cleaned or coated. Examples include: mechanical and electrical equipment (open or enclosed), instruction and similar plates, and wet and newly coated surfaces.
 2. Protect from abrasive blast particles and airborne coating particles.
 3. Prevent damage from power tool cleaning and bumping or striking with foreign object.
- B. Do not move newly coated items until coating is thoroughly dry as determined by one of following:
 1. Coating manufacturer's instructions for handling.
 2. Coating film cannot be distorted or removed by exerting substantial, but less than maximum, pressure with thumb and turning thumb through 90 degrees in plane of film.

3.02 REPAIR OF CONTRACTOR-DAMAGED SURFACES

- A. Repair items, equipment, or surfaces which are damaged or contaminated as determined by Contracting Officer's Representative.
 1. Repair damaged items or restore manufacturer-coated equipment to original condition and appearance.
 2. Before top coating any coated surfaces, re-clean exposed surface and apply coating materials in accordance with these specifications.

3.03 PREPARATION

- A. Remove or repair weld spatter, slag burrs, porosity, sharp edges, pits, laminations, crevices, or other objectionable surface irregularities before specific surface preparation.
- B. Specific Surface Preparation:
 1. Use method specified in Coating Tabulations below.
 2. Method A: SSPC-SP1.
 3. Method B: SSPC-SP6/NACE 3.
 4. Method B-1:
 - a. Remove or repair surface irregularities and solvent clean surface in accordance with Method A.

- b. SSPC-SP6/NACE3 to bare metal substrate.
 - c. SSPC-SP11, where abrasive blasting is impractical. Rotary Power bush is not permitted.
 - d. Feather edges of existing coating around repair area with non-woven pad.
- 5. Method C: SSPC-SP10/NACE 2.
- 6. Method G: ASTM D 380.
- 7. Method I:
 - a. Remove or repair surface irregularities and solvent clean surface in accordance with Method A.
 - b. SSPC-SP7/NACE 4.
 - c. SSPC-SP3, where abrasive blasting is impractical. Rotary power bush is not permitted.
 - d. Chemical treatments recommended by coating manufacturer.
- C. Surface Profile:
 - 1. Prepare in accordance with manufacturer's instructions for metallic or existing coating surfaces and service environment.
 - 2. Where manufacturer's instruction do not specify a surface profile, prepare blasted surfaces to following profile:
 - a. Atmospheric Service Environments: 1 mil or greater angular profile and less than specified millage of first applied coat.
 - b. Burial and Immersion Service Environments: Angular profile between 1.5 to 3-mils.
- D. Re-clean or perform additional surface preparation of completed metallic or coated surfaces that become contaminated before coating application.
- E. Prepare surface free of moisture, frost, and ice. Heat substrate surface which is not thoroughly dry to remove moisture before coating application.

3.04 COATING APPLICATION

- A. Apply in accordance with manufacturer's instructions.
- B. Apply coatings so that surfaces exposed to public view display a uniform texture and color matched appearance.
- C. Apply an even film of uniform thickness which tightly bonds to substrate or previous coat.
 - 1. Fill crevices and cover irregularities.
 - 2. Apply free of runs, pinholes, sags, laps, brush marks, voids, and other defects.
- D. Primer Coats:
 - 1. Cover peaks of surface profile by specified dry film thickness.
 - 2. Stripe coat all edges, boltheads, welds, corners, voids, and other defects.
- E. Intermediate and Topcoats:
 - 1. Apply number of coats and thickness specified in Coating Tabulations below.
 - 2. Apply within recoat window recommended by manufacturer.
 - 3. Apply succeeding coats with tinted contrasting color to differentiate between coats, unless specified below.

3.05 INSPECTIONS

- A. Equipment: Inspect air supply lines on air compressors for oil and moisture in accordance with ASTM D 4285. Remove oil or water before proceeding with work.
- B. Surface Profile: Inspect surface profile in accordance with NACE RP 0287 for compliance with specified requirements. Measurement of less than 1.5 mil is permitted when coarse replica tape suitable for 0 to 2 mil range is used.
- C. Surface Cleanliness:
 - 1. After surface preparation, compare steel surfaces to following visual reference photographs for degree of surface cleanliness:
 - a. SSPC-VIS 1 for abrasive blast cleaning.
 - b. SSPC-VIS 3 for hand and power cleaning.
- D. Completed Coating System:
 - 1. Dry Film Thickness (DFT):
 - a. Inspect hardened coating system before re-coating interval has been exceeded for DFT compliance in accordance with SSPC-PA 2 with following modifications:
 - 1) Section 5.2.1: Minimum thickness of 90 percent of specified minimum thickness.
 - 2) Section 5.2.2: Maximum thickness of 150 percent of specified maximum thickness.
 - b. Acceptance Criteria: No single spot measurement in any 100 square foot area less than 90 percent of minimum specified thickness or greater than 150 percent of maximum specified thickness.
 - 2. Discontinuity (Holiday) Testing:
 - a. Burial and Immersion Exposure:
 - 1) Inspect nonconductive coating applied to conductive base metals in accordance with NACE RP 0188.
 - a) Use maximum test voltage for any DFT as recommended by coating manufacturer to prevent coating damage.
 - b) Test coating systems with zinc primers and coating material pigmented with micaceous iron oxide (MIO) with low voltage increased to a non-damaging maximum test voltage.
 - c) Use of detergent wetting solution is not permitted.
 - 2) Perform test in presence of Contracting Officer's Representative. Notify Contracting Officer's Representative of time of test at least 72 hours before beginning test.

3.06 REPAIR OF DEFECTIVE COATED SURFACES

- A. Repair within minimum and maximum re-coat window times in accordance with coating manufacturer's recommendations and applicable Coating Tabulation under which coating was applied.

- B. Repair pinholes, holidays, laps, voids, and other defects.
- C. Inspect repaired areas for compliance with specifications.

3.07 COATING TABULATIONS

Tabulation No. 01. - The surfaces of the metalwork items listed below shall be prepared and coated in accordance with this tabulation. Items to be coated: a. Fixtures, stands and jigs.		
Coating materials	Number and thickness of coats	Surface preparation method
Prime Coat: Category: IE-W2 Intermediate Coat: Category: IE-W4 Top coat: Category: IE-W5 (Colors and glosses as shown in the Color Schedule.)	Prime: One or more coats, to produce a DFT between 2 to 3 mils per coat Intermediate: One or more coats, to produce a DFT between 2 to 3 mils per coat Top: One or more coats, to produce a DFT between 2.5 to 3.5 mils per coat 6-mil DFT, minimum, for total system, excluding edge coat	C

<p>Tabulation No. 02. -</p> <p>The surfaces of the metalwork listed below are presently coated. The entire surfaces shall be cleaned, and the areas that require coating repair shall be prepared and coated in accordance with the following.</p> <p>Items to be coated:</p> <ol style="list-style-type: none"> Turbine-Generator shaft (3 shafts - existing coating Coal-tar) Watertight door (3 doors - primed and unfinished) Sets of Bulkhead gates (existing coating Tar, color Black) 		
Coating materials	Number and thickness of coats	Surface preparation method
<p>Primer and Top Coat: Category: IES-2D</p> <p>(Colors and glosses as shown in the Color Schedule.)</p>	<p>Prime: ONE or more coats, to produce a DFT between 2 to 3 mils per coat</p> <p>Top: ONE or more coats, to produce a DFT between 2.5 to 3.5 mils per coat</p> <p>6-mil DFT, minimum, for total system, excluding edge coat</p>	<p>C Shaft</p> <p>C and B Door</p> <p>A and C Gates</p>
<p>Stainless steel, bronze, rubber, bearing surfaces or mating surfaces shall be protected during surface preparation and coating operations.</p>		

Tabulation No. 03. -		
The exterior surfaces of the items listed below, have an existing finish of alkyd enamel. The entire exterior surfaces of the items listed below shall be prepared and coated in accordance with this tabulation.		
Items to be coated:		
1. TURBINES - THREE (3) UNITS		
a.	Turbine mandoor.	
b.	Draft tube.	
c.	Turbine-Generator shaft guard.	
d.	Outer gate barrel.	
e.	Slip joint.	
f.	Discharge ring.	
g.	Servomotors assembly, support column assembly and ladder.	
h.	Gate operating mechanisms.	
i.	Air admission piping	
2. GENERATORS - THREE (3) UNITS		
a.	Bases	
b.	Air housings.	
c.	Bearing housing.	
d.	Exciter 5-kW and exciter bus duct	
e.	Pipe, fittings, and valves to the generator	
3. TRENCH FRAMES AND TRENCH COVERS		
Coating materials	Number and thickness of coats	Surface preparation method
Base coats:	2 or more coats	B followed by: B-1 For spotty, damaged, rusted, oily or greasy areas of the surface to be coated or repaired
Categories: IE-1J	6-mil DFT, minimum, per coat 12-mil DFT, minimum, for base coat, plus edge coats	
Finish coat(s):	2 to 4 mils DFT, minimum, for finish coat, per coat	Follow the manufacturer's specific application instructions for surface preparation before applying next coat.
Category: IE-1DT (Colors and glosses as shown in the color schedule.)	14-mil DFT, minimum, for total system, excluding edge coats	
Expansion joints, bronze, stainless steel, machined surfaces, and concrete surfaces shall be protected during surface preparation and coating operations.		

NOTE: Do not damage or coat the seals.

3.08 COATING CATEGORIES

Category IE-1DT

Category IE-1DT coating system shall be:

Devthane 379, Aliphatic Urethane Gloss Enamel; as manufactured by:

Devoe Coatings
4000 Dupont Circle
Louisville KY 40207
(502) 897-9861

or equal, having the following salient characteristics:

COMPOSITION:

Two-component, aliphatic, polyurethane, topcoat

PHYSICAL CHARACTERISTICS:

Volume solids:	63 percent, minimum
VOC (as supplied):	2.6 pounds per gallon (311 grams per liter), maximum
Minimum curing temperature:	40 degrees F
Surface application temperature above dew point:	5 degrees F, minimum
Mixed usable pot life at 77 degrees F:	4 hours, minimum
Maximum applied DFT per coat:	3 mils
Recoating time at 80 degrees F and 50 percent relative humidity:	3 hours, minimum; 24 hours, maximum
Mixing ratio:	4 to 1, by volume
Application method:	Brush, roller, conventional, or airless spray
Time before immersion after the final coat has been applied at 70 degrees F:	6 days, minimum

COATING SYSTEM PERFORMANCE REQUIREMENTS:

Fresh/Deionized water immersion test: (ASTM D 870)	passes 3,000 hour test with aerated water held at ambient temperatures with no blisters evident on either the scribed or unscribed sides.
Salt water immersion test: (ASTM D 870, ASTM D 1141 formula A with no heavy metals)	passes 3,000 hour test with aerated water held at ambient temperatures with no blisters evident on either the scribed or unscribed sides.
QUV Accelerated weathering test: (ASTM 4587), ASTM G 53)	passes 3,000 hour test with no blisters evident on either the scribed or unscribed sides, minimal chalking (ASTM D 4214) or color difference (ASTM D 2244).
Flexibility: (ASTM D 522, 180 degree bend over 1-inch mandrel)	passes
Pencil hardness: (ASTM D 3363)	2B, minimum
Pulloff Adhesion: (ASTM D 4541) (Elcometer)	greater than 500 psi
Tape adhesion: (ASTM D 3359)	equal to or better than 4A
Cathodic disbondment: (Applicable tests includes but are not limited to: ASTM G 8, ASTM G 42, ASTM G 95)	Has passed a recognized standard cathodic disbondment test, when applied over the specified epoxy base coat.

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Category IE-1J

Category IE-1J coating system shall be:

Bar-Rust 235, Multi-Purpose Epoxy; as manufactured by:

Devoe Coatings
 4000 Dupont Circle
 Louisville KY 40207
 (502) 897-9861

or equal, having the following salient characteristics:

COMPOSITION:

Self-priming, two-component, modified polyamide amine epoxy

PHYSICAL CHARACTERISTICS:

Volume solids:	68 percent, minimum
VOC (as supplied):	2.4 pounds per gallon (292 grams per liter), maximum
Minimum curing temperature:	40 degrees F
Surface application temperature above dew point:	5 degrees F, minimum
Mixed usable pot life at 77 degrees F and 50 percent relative humidity:	3.5 hours, minimum
Maximum applied DFT per coat:	8 mils
Recoating time at 77 degrees F and 50 percent relative humidity:	5 hours, minimum; 1 month, maximum
Mixing ratio:	4 to 1, by volume
Application method:	Brush or roller (small areas only); conventional or heavy-duty airless spray (preferred)
Time before immersion after the final coat has been applied at 70 degrees F:	7 days, minimum

COATING SYSTEM PERFORMANCE REQUIREMENTS:

Fresh/Deionized water immersion test: (ASTM D 870)	passes 3,000 hour test with aerated water held at ambient temperatures with no blisters evident on either the scribed or unscribed sides.
Salt water immersion test: (ASTM D 870, ASTM D 1141 formula A with no heavy metals)	passes 3,000 hour test with aerated water held at ambient temperatures with no blisters evident on either the scribed or unscribed sides.
QUV Accelerated weathering test: (ASTM 4587, ASTM G 53)	passes 3,000 hour test with no blisters evident on either the scribed or unscribed sides, minimal chalking (ASTM D 4214) or color difference (ASTM D 2244).
Flexibility: (ASTM D 522, 180 degree bend over 1-inch mandrel)	passes
Pencil hardness: (ASTM D 3363)	3H, minimum
Pulloff Adhesion: (ASTM D 4541) (Elcometer)	greater than 500 psi
Tape adhesion: (ASTM D 3359)	equal to or better than 4A
Cathodic disbondment: (Applicable tests includes but are not limited to: ASTM G 8, ASTM G 42, ASTM G 95)	Has passed a recognized standard cathodic disbondment test.

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Category IE-W2

Category IE-W2 primer coatings shall be:

MC-Miozinc; as manufactured by:

Wasser High-Tech Coatings
8401 S. 228th, Building. 103
Kent WA 98032
(206) 850-2967

or equal, having the following salient characteristics:

COMPOSITION:

Aromatic, single-component, moisture cure urethane - pigmented with micaceous iron oxide (MIO) at minimum loading of 4 pounds per gallon.

Lead and chromate free

PHYSICAL CHARACTERISTICS:

Volume solids:	59 percent, minimum
Weight per gallon:	20.2 ± 0.6 pounds per gallon
VOC (as supplied), maximum:	2.8 pounds per gallon (335 grams per liter)
Minimum application temperature:	40 °F
Maximum applied DFT per coat:	3 mils
Curing time at 75 °F:	Touch - 20 minutes; Handle - 8 hours
Recoating time at 50 to 90 °F and 60 percent relative humidity:	4 hours, minimum; no maximum
Application method:	Brush, roller, conventional or airless spray

COATING SYSTEM PERFORMANCE REQUIREMENTS:

Direct impact resistance: (ASTM D 2794)	greater than 150 inch pounds
Flexibility: (ASTM D 522, 180° bend over 1/4-inch mandrel)	passes
Abrasion resistance: (ASTM D 4060, CS-17 wheel, 1,000 cycles, 1 kg, Taber Abrasion)	45 mg loss
Pencil hardness: (ASTM D 3363)	2B, minimum
Pulloff Adhesion: (ASTM D 4541) (Elcometer)	greater than 500 psi
Tape adhesion: (ASTM D 3359)	equal to or better than 4A or 4B

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Category IE-W4

Category IE-W4 primer over previously coated surface or intermediate coating shall be:

MC-Ferrox B; as manufactured by:

Wasser High-Tech Coatings
8401 S. 228th, Building. 103
Kent WA 98032
(206) 850-2967

or equal, having the following salient characteristics:

COMPOSITION:

Aromatic, single-component, moisture cure urethane - pigmented with micaceous iron oxide (MIO) at minimum loading of 4 pounds per gallon.

Lead and chromate free

PHYSICAL CHARACTERISTICS:

Volume solids:	59 percent, minimum
Weight per gallon:	13.5 ± 0.6 pounds per gallon
VOC (as supplied), maximum:	2.8 pounds per gallon (335 grams per liter)
Minimum application temperature:	40 °F
Maximum applied DFT per coat:	5 mils
Curing time at 75 °F:	Touch - 30 minutes; Handle - 18 hours
Recoating time at 50 to 70 °F and 60 percent relative humidity:	4 hours, minimum; no maximum
Application method:	Brush, roller, conventional or airless spray

COATING SYSTEM PERFORMANCE REQUIREMENTS:

Fresh/Deionized water immersion test: (ASTM D 870)	passes 3,000 hour test with aerated water held at ambient temperatures with no blisters evident on either the scribed or unscribed sides.
Salt water immersion test: (ASTM D 870, ASTM D 1141 formula A with no heavy metals)	passes 3,000 hour test with aerated water held at ambient temperatures with no blisters evident on either the scribed or unscribed sides.
QUV Accelerated weathering test: (ASTM 4587, ASTM G 53)	passes 3,000 hour test with no blisters evident on either the scribed or unscribed sides, minimal chalking (ASTM D 4214) or color difference (ASTM D 2244).
Direct impact resistance: (ASTM D 2794)	greater than 150 inch pounds
Flexibility: (ASTM D 522, 180° bend over ½-inch mandrel)	passes
Pencil hardness: (ASTM D 3363)	2B, minimum
Pulloff Adhesion: (ASTM D 4541) (Elcometer)	greater than 500 psi
Tape adhesion: (ASTM D 3359)	equal to or better than 4A or 4B

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Category IE-W5

Category IE-W5 topcoat shall be:

MC-Ferrox A; as manufactured by:
 Wasser High-Tech Coatings
 8401 S. 228th, Building. 103
 Kent WA 98032
 (206) 850-2967

or equal, having the following salient characteristics:

COMPOSITION:

Aliphatic, single-component, moisture-cure urethane - pigmented with micaceous iron oxide (MIO)
 at minimum loading of 4 pounds per gallon.

Lead and chromate free

PHYSICAL CHARACTERISTICS:

Volume solids:	60 percent, minimum
Weight per gallon:	13.0 ± 1.0 pounds per gallon
VOC (as supplied), maximum:	2.8 pounds per gallon (335 grams per liter)
Minimum application temperature:	40 °F
Maximum applied DFT per coat:	3.5 mils
Curing time at 75 °F:	Touch - 30 minutes; Handle - 18 hours
Recoating time at 60 to 90 °F and 60 percent relative humidity:	6 hours, minimum; no maximum
Application method:	Brush, roller, conventional or airless spray

COATING SYSTEM PERFORMANCE REQUIREMENTS:

Fresh/Deionized water immersion test: (ASTM D 870)	passes 3,000 hour test with aerated water held at ambient temperatures with no blisters evident on either the scribed or unscribed sides.
Salt water immersion test: (ASTM D 870, ASTM D 1141 formula A with no heavy metals)	passes 3,000 hour test with aerated water held at ambient temperatures with no blisters evident on either the scribed or unscribed sides.
QUV Accelerated weathering test: (ASTM 4587-91, ASTM G 53-94)	passes 3,000 hour test with no blisters evident on either the scribed or unscribed sides, minimal chalking (ASTM D 4214) or color difference (ASTM D 2244).
Direct impact resistance: (ASTM D 2794)	greater than 150 inch pounds
Flexibility: (ASTM D 522, 180° bend over ½-inch mandrel)	passes
Pencil hardness: (ASTM D 3363)	2B, minimum
Pulloff Adhesion: (ASTM D 4541) (Elcometer)	greater than 500 psi
Tape adhesion: (ASTM D 3359)	equal to or better than 4A or 4B

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Category IES-2D

Category IES-2D coating system shall be:

MC-Zinc, primer; MC-Tar, topcoat; as manufactured by:

Wasser High-Tech Coatings
8401 S. 228th, Building. 103
Kent WA 98032
(206) 850-2967

or equal, having the following salient characteristics:

COMPOSITION:

Primer - Aromatic, single component, moisture-cure, urethane - zinc pigmented containing a minimum of 83 percent, by weight, of zinc in dry film.

Topcoat - Aromatic, single component, moisture-cure, urethane, refined tar - pigmented with micaceous iron oxide at a minimum loading of 3.5 pounds per gallon

Lead and chromate free

PHYSICAL CHARACTERISTICS, PRIMER:

Volume solids:	60 percent, minimum
Weight per gallon:	23.7 ± 0.8 pounds per gallon
VOC (as supplied):	2.8 pounds per gallon (335 grams per liter), maximum
Minimum application temperature:	20 degrees F (Inspector must approve application below 33 degrees F)
Maximum applied DFT per coat:	3.5 mils
Curing time at 75 degrees F:	Touch - 20 minutes; Handle - 8 hours; Stack - 10 hours
Recoating time at 50 to 90 degrees F and 60 percent relative humidity*:	4 hours, minimum; no maximum
Application method:	Brush, roller, conventional or airless spray

PHYSICAL CHARACTERISTICS, TOPCOAT:

Volume solids:	59 percent, minimum
Weight per gallon:	13.0 ± 0.5 pounds per gallon
VOC (as supplied):	2.8 pounds per gallon (335 grams per liter), maximum
Minimum application temperature:	20 degrees F (Inspector must approve application below 33 degrees F)
Maximum applied DFT per coat:	7 mils
Curing time at 75 degrees F:	Touch - 20 minutes; Handle - 8 hours; Stack - 12 hours
Recoating time at 50 to 90 degrees F and 60 percent relative humidity*:	4 hours, minimum; no maximum
Application method:	Brush, roller, conventional, or airless spray
Time before immersion after final coat has been applied at 40 to 90 degrees F and 30 percent relative humidity:	8 hours, minimum (special immersion situations may be permitted after 1 hour)

COATING SYSTEM PERFORMANCE REQUIREMENTS:

Fresh/Deionized water immersion test: (ASTM D 870)	passes 3,000 hour test with aerated water held at ambient temperatures with no blisters evident on either the scribed or unscribed sides.
Salt water immersion test: (ASTM D 870, ASTM D 1141 formula A with no heavy metals)	passes 3,000 hour test with aerated water held at ambient temperatures with no blisters evident on either the scribed or unscribed sides.

Category IES-2D

QUV Accelerated weathering test: (ASTM 4587, ASTM G 53)	passes 3,000 hour test with no blisters evident on either the scribed or unscribed sides, minimal chalking (ASTM D 4214) or color difference (ASTM D 2244).
Direct impact resistance: (ASTM D 2794)	greater than 150 inch pounds
Flexibility: (ASTM D 522, 180 degree bend over ½-inch mandrel)	passes
Pencil hardness: (ASTM D 3363)	2B, minimum
Pulloff Adhesion: (ASTM D 4541) (Elcometer)	greater than 500 psi
Tape adhesion: (ASTM D 3359)	equal to or better than 4A
* Additional recoat time is required at temperatures of 20 to 40 degrees F and humidities of 10 to 30 percent.	

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3.09 COLOR

- A. Colors and gloss of finish coats: see Color Table below.
- B. Obtain an accurate match of color and gloss for coated surfaces.
- C. For items required to be coated but not listed in Color Table, Regional Engineer to select colors from Color Table.
- D. Color reference numbers:
 - 1. 5-digit number: Federal Standard No. 595B; General Services Administration, (3F BP-W), Specification Unit, Suit 8100, 470 L'Enfant Plaza SW, Washington DC 20407; telephone (202) 755-0325/0326; Individual color chips available from General Services Administration
 - 2. Manufacturer's standard color varies.
- E. Gloss abbreviations:
 - 1. SG: Semigloss
 - 2. LG: Low Gloss
- F. Color Table
 - 1. Numbers listed in "Tabulation No." column refer to corresponding item to be coated in tabulations.

Tabulation No.	Item Surface	Color	Color No.	Gloss
01	a. Fixtures, stands and jigs	Safety Yellow		SG
02	a. Turbine-Generator shaft b. Watertight door c. Bulkhead gates (existing color Black)	Black	MFR.	LG
03	1. Turbines: a. Turbine man doors b. Draft tube c. Generator-turbine shaft guard d. Outer gate barrel e. Slip joint f. Discharge ring g. Servomotors assembly, supports, etc h. Gate operating mechanisms I. Air admission piping	Blue	04035	LG
	2. Generators a. Bases b. Air housing c. Bearing housing (u/s and d/s) d. Exciter and bus duct e. Pipe, fittings and valves to generator			
04	a. Bulkhead gates with lifting frame (Existing color Green)	Blue-Green	MFR.	LG

END OF SECTION